

Effect of Cellulase Pretreatment for n-Hexane Extraction of Oil from Garden Cress Seeds

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Abstract : Garden cress (*Lepidium Sativum* L.) belonging to the family Brassicaceae, is edible growing annual herb. Its various parts (roots, leaves and seeds) have been used to treat various human ailments. Its seed extracts have been screened for various biological activities like hypotensive, antimicrobial, bronchodilator, hypoglycaemic and antianemic. The aim of the present study is to optimize the process parameters (cellulase concentration and incubation time) of enzymatic pre-treatment of the garden cress seeds and to evaluate the effect of cellulase pre-treatment of the crushed seeds on the oil yield, physico-chemical properties and antibacterial activity and comparing to non-enzymatic method. The optimum parameters of cellulase pre-treatment were as follows: cellulase of 0,1% w/w and incubation time of 2h. After enzymatic pre-treatment, the oil was extracted by n-hexane for 1.5 h, the oil yield was 4,01% for cellulase pre-treatment as against 10,99% in the control sample. The decrease in yield might be caused a result of mucilage. Garden cress seeds are covered with a layer of mucilage which gels on contact with water. At the same time, the antibacterial activity was carried out using agar diffusion method against 4 food-borne pathogens (*Escherichia coli*, *Salmonella typhi*, *Staphylococcus aureus*, *Bacillus subtilis*). The results showed that bacterial strains are very sensitive to the oil with cellulase pre-treatment. *Staphylococcus aureus* is extremely sensitive with the largest zone of inhibition (40 mm), *Escherichia coli* and *salmonella typhi* had a very sensitive to the oil with a zone of inhibition (26 mm). *Bacillus subtilis* is averagely sensitive which gave an inhibition of 16 mm. But it does not exhibit sensitivity to the oil without enzymatic pre-treatment with a zone inhibition (< 8 mm). Enzymatic pre-treatment could be useful for antimicrobial activity of the oil, and hold a good potential for use in food and pharmaceutical industries.

Keywords : *Lepidium sativum* L., cellulase, enzymatic pretreatment, antibacterial activity.

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